

SAFETY CATCH MECHANISM OF NAIL GUNS

FIELD OF THE INVENTION

The present invention relates to a nail gun assembly,
5 more particularly to a nail gun assembly with a safety
catch mechanism for preventing users from shooting the
nail gun without nails.

BACKGROUND OF THE INVENTION

In general, a prior-art nail gun usually comprises a
10 muzzle disposed at the front end of a nailing device in
the main body of the nail gun, a magazine
interconnectably disposed at the bottom of the muzzle
for accommodating and storing nails. Further, a trigger
is disposed on the handle of the main body of the nail
15 gun for controlling the high-pressure airflow inside the
nail gun and a firing pin of the nail gun for the shooting.
By the shooting force of the firing pin, the nail in the
muzzle can be shot into a work piece.

However, when users use such prior-art nail gun, the
20 nails are shot continuously without knowing the current
quantity of nails in the magazine. Therefore, after the
nails in the magazine are exhausted, users may continue
to cock the trigger. Some users even cock the trigger
for several times intentionally to make sure there is no
25 nail in the magazine before reloading the magazine with

nails. As to the structure of the nail gun, shooting by a firing pin or other firing device without nails in the magazine may have adverse effects on the life of the nail gun or even cause damages to the nail gun.

5 **SUMMARY OF THE INVENTION**

The primary objective of the present invention is to provide a safety catch mechanism for preventing users from shooting without nails in the magazine. By means of a blocking plate and a rotary rod, if there is no nail in
10 the magazine, the blocking plate will block the rear of the trigger and prevent the trigger from being cocked. If the magazine is loaded with nails, then the latch can be pushed to drive the push arm to rotate outward, such that the blocking plate is separated from the rear of the
15 trigger, and thus allowing users to cock the trigger. Therefore, the present invention can effectively prevent user from shooting a nail gun without nails in the magazine, and thus preventing the structure of the firing device and firing pin from being damaged or the life of
20 use shortened due to the firing without having nails in the magazine.

The technical measures taken by the invention to overcome the aforementioned shortcomings are given below:

25 A safety catch mechanism for preventing a nail gun

from shooting without nails in the magazine comprises:
a main body, having a trigger disposed on a handle of
said main body, a muzzle disposed at the front end of the
main body, and a magazine interconnectably disposed at
5 the bottom of the muzzle; wherein a through hole is
disposed on the upper wall of the magazine and an axle
section protruded from one side of the magazine;
a rotary rod, being movably disposed on the axle section,
and having a push arm extended from the front end of the
10 rotary rod, an embedding plate being bent from the front
end of the push arm, an embedding groove disposed on
the embedding plate, a blocking arm extended from the
rear of the rotary rod and bent in the direction towards
the trigger, and a blocking plate being bent from the rear
15 end of the blocking arm and extended to the rear of the
trigger; and
a limit plate, being movably passed into the through hole
of the magazine, and one end of the limit plate being
movably embedded into the embedding groove of the
20 rotary rod, wherein the limit plate forms a latch
protruded from an inner wall of the magazine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of the safety catch mechanism
of the present invention.

25 FIG. 2 is a view of the safety catch mechanism of the

present invention.

FIG. 3 is another view of the safety catch mechanism of the present invention.

FIG. 4 is a view of the movements of the safety catch mechanism of the present invention.

FIG. 5 is another view of the movements of the safety catch mechanism of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 To make it easier for our examiner to understand the objective of the invention, its structure, innovative features, and performance, we use a preferred embodiment together with the attached drawings for the detailed description of the invention.

15 Please refer to FIGS. 1 to 3 for a safety catch mechanism of the present invention, which comprises:

a main body 10, having a trigger 12 disposed on a handle 11, and a muzzle 13 disposed at the front end of the main body 10, a magazine 14 disposed under the muzzle 13 and interconnected with the muzzle 13, and a nail feeder 15 disposed in the magazine 14 for continuously pushing the nails stored in the magazine 14 out towards the muzzle 13; wherein a through hole 141 is disposed on an upper wall of the magazine 14; an axle section 142 is protruded from a side of the magazine 14;

and a transversal groove 143 is transversally disposed on the axle section 142;

a rotary rod 20, disposed on an axial section 21, and the axial section 21 having an axial hole 211 in the middle for allowing a screw rod 212 to pass through, and
5 the axis of the rotary rod 20 being fixed in the transversal groove 143 of the axle section 142; a push arm 22 being extended forward from the front end of the axial section 21; an embedding plate 221 bent from the
10 front end of the push arm 22; an embedding groove 222 disposed on the embedding plate 221; a blocking arm 23 being bent and extending in an aslant direction from the rear end of the axial section 21 towards the trigger 12; a blocking plate 231 being bent from the rear end of the
15 blocking arm 23 and extended to the rear of the trigger 12; wherein a spring bracket 24 is disposed on an inner side of the rotary rod 20, and a spring 241 is embedded in a position corresponding to a sidewall of the magazine 14 for providing the resilience for the rotary rod 20;
20 further, a press arm 25 is extended from the rotary rod 20 having a press button 251 bent from the end of the press arm 25;

a limit plate 30, movably passing into the through hole 141 of the magazine 14 and one side of the limit
25 plate 30 being movably embedded into the embedding

groove 222 of the rotary rod 20; wherein the limit plate 30 forms a latch 31 protruded from the inner wall of the magazine 14.

Accompanied with the description of the foregoing
5 structure, the principle of the movements for this invention is elaborated as follows:

Please refer to FIG. 4 for the invention. If there is no nail in the magazine 14, the spring bracket 24 of the rotary rod 20 will push the limit plate 30 towards the
10 magazine 14 by a resilient force of the spring 241, and then the blocking plate 231 will block the rear of the trigger 12, such that if there is no nail in the magazine 14, the blocking plate 231 will automatically block the rear of the trigger 12 to set the rotary rod 20 at a safety
15 protection mode, and thus users cannot cock the trigger 12. Such arrangement prevents the nail gun from being shot when there is no nail in the magazine, and thus protecting the structures including the firing device and the firing pin from being damaged by shooting without
20 nails in the magazine or preventing the shortened life of use.

If nails are loaded in the magazine 14, the nail feeder
15 in the magazine will continuously push the stored nails towards the muzzle 13. When a nail is pushed to
25 the top of the magazine 14 (as shown in FIG. 5), the nail

will automatically push the latch 31 out from the magazine 14 and drive the rotary rod 20 to rotate, and the blocking plate 231 will be separated automatically from the rear of the trigger 12 and switched to a free shooting mode, such that a user can freely cock the trigger to shoot out a nail in the magazine 14.

Further, accompanied with the disposition of the press arm 25 and the press button 251, after the last nail in the magazine 14 enters into the muzzle 13, there will be no nail in the magazine 14 to press the latch 31, and thus the rotary rod 20 will resume its original position by the resilient force pushed by the spring 241, and the blocking plate 231 will block the rear of the trigger 12 and return to the safety protection mode, which causes the situation of unable to shoot the last nail. Users may manually press the press button 251 of the rotary rod 20 to separate the blocking plate 231 and manually switch the rotary rod to the free shooting mode for the shooting. Alternatively, if a nail in the magazine 14 is stuck or has other situations, users may make use of the press button 251 to cock the trigger and eliminate the failing conditions.

In summation of the above description, the present invention enhances the performance of the conventional structure, and further complies with the patent

application requirements and is submitted to the Patent and Trademark Office for review and granting of the commensurate patent rights.

While the invention has been described by way of
5 example and in terms of a preferred embodiment, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be
10 accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.